

Claims

What is claimed is:

1. A method of setting a predetermined clearance in an internal combustion engine between a rocker arm and a rocker arm actuated engine component, in which a rocker arm is rotatably mounted on a rocker shaft for reciprocating movement relative thereto, the rocker arm having a first end located on a first side of the rocker shaft and a second end located on a second side of the rocker shaft, the first end of the rocker arm having an adjustment screw extending therethrough to act on an end of a push rod, the second end of the rocker arm being movable in a first, component-actuating, direction and in a second direction opposite to said first direction and having a component engaging surface co-operating with a portion of the rocker arm actuated engine component, at least a portion of the rocker arm actuated engine component being biased in said second direction towards a first position and being movable against the bias in said first direction towards a second position, the method comprising the steps of:

- (a) setting the rocker arm to a zero position and recording said zero position as a reference datum;
- (b) rotating the adjustment screw to adjust the position of said rocker arm to a first reference position;
- (c) rotating the adjustment screw through a reference angle and recording a corresponding second reference position thereof;
- (d) calculating a coefficient from the difference between said first and second reference positions and said reference angle;
- (e) using said coefficient to calculate an angular rotation of the adjustment screw corresponding to said predetermined clearance; and

(f) rotating the adjustment screw on the basis of said calculated angular rotation to set the predetermined clearance relative to said reference datum.

2. The method of claim 1 wherein said rocker arm actuated engine component includes an engine valve having a valve stem, and wherein said rocker arm includes a valve engaging surface co-operating with an end of the valve stem.

3. The method of claim 1 wherein said rocker arm actuated engine component includes a bridge connecting plural engine valves.

4. The method of claim 1 wherein said rocker arm actuated engine component includes a tappet of a mechanically actuated unit fuel injector.

5. The method of claim 2 wherein the step of setting the rocker arm to said zero position comprises setting the rocker arm to a position in which said valve engaging surface of the rocker arm contacts the end of the valve stem without displacing the valve stem from its first position.

6. The method of claim 1 wherein said first reference position is a position in which backlash affecting the position of the rocker arm is substantially neutralized.

7. The method of claim 1 wherein step (a) includes moving said rocker arm in said first direction to said zero position.

8. The method of claim 1 wherein the adjustment screw is rotatable in a first angular direction for movement towards the push rod and in a second angular direction for movement away from the push rod, and wherein step (b) includes rotating said adjustment screw in said first angular direction such

that said rocker arm is displaced from its first position to a third position intermediate said first and second positions.

9. The method of claim 8 wherein step (b) further includes rotating the adjustment screw in said second angular direction through a predetermined angle such that said rocker arm moves from its third position to a fourth position intermediate said third and first positions.

10. The method according to claim 9 wherein step (c) includes rotating the adjustment screw through said reference angle in said second angular direction such that the rocker arm moves from said fourth position towards said first position.

11. The method of claim 1 wherein the adjustment screw has a lock nut associated therewith, and wherein step (a) includes loosening said lock nut prior to setting the rocker arm to said zero position.

12. The method of claim 11 wherein the lock nut is tightened slightly following step (c) and prior to step (f).

13. The method of claim 12 wherein the lock nut is tightened fully following step (f).

14. The method of claim 12 wherein said angular rotation calculated in step (e) corresponds to said predetermined valve clearance plus a correction distance representing a displacement of the second end of the rocker arm caused by said slight tightening of the lock nut.

15. The method of claim 14 wherein step (f) comprises rotating the adjustment screw such that the second end of the rocker arm is displaced from the zero position in said first direction by said correction distance

and the predetermined valve clearance is then set by rotating the adjustment screw through the angular rotation calculated in step (e).

16. An apparatus for setting a predetermined clearance in an internal combustion engine between a rocker arm and a rocker arm actuated engine component, in which a rocker arm is rotatably mounted on a rocker shaft for reciprocating movement relative thereto, the rocker arm having a first end located on a first side of the rocker shaft and a second end located on a second side of the rocker shaft, the first end of the rocker arm having an adjustment screw extending therethrough to act on an end of a push rod, the second end of the rocker arm being movable in a first, component-actuating, direction and in a second direction opposite to said first direction and having a component engaging surface co-operating with a portion of the rocker arm actuated engine component, at least a portion of the rocker arm actuated engine component being biased in said second direction towards a first position and being movable against the bias in said first direction towards a second position, the apparatus comprising:

an electronic controller;

a rocker arm actuator responsive to said electronic controller to selectively rotate the rocker arm relative to the rocker shaft;

a rocker arm position sensor operably connected with said electronic controller to record with said electronic controller the position of the second end of said rocker arm; and

an adjustment screw rotator responsive to said electronic controller to selectively rotate the rocker arm adjustment screw;

wherein said electronic controller is programmed to (a) cause said rocker arm actuator to set the rocker arm to a zero position and record said zero position as a reference datum, (b) cause the adjustment screw rotator to rotate the adjustment screw to adjust the position of said rocker arm to a first reference position and then rotate the adjustment screw through a reference angle, (c) record a corresponding second reference

position of the rocker arm, (d) calculate a coefficient from the difference between said first and second reference positions and said reference angle, (e) use said coefficient to calculate an angular rotation of the adjustment screw corresponding to said predetermined clearance, and (f) cause said adjustment screw rotator to rotate the adjustment screw on the basis of said calculated angular rotation to set the predetermined clearance relative to said reference datum.